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*Indian Standard*  
**SPECIFICATION FOR  
BALLAST RAKES**

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**INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
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# Indian Standard

## SPECIFICATION FOR BALLAST RAKES

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# *Indian Standard*

## SPECIFICATION FOR BALLAST RAKES

### 0. F O R E W O R D

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 29 January 1971, after the draft finalized by the Hand Tools Sectional Committee had been approved by the Mechanical Engineering Division Council.

**0.2** This standard lays down the requirements for ballast rakes used by the railways for handling ballast on rail tracks.

**0.3** While preparing this standard, assistance has been derived from the following:

IRS Specification Y3-61 Specification for IRS permanent way tools for broad, metre and narrow gauge tracks. Ministry of Railways, Government of India.

IRS Drg Y31 Ballast rake. Ministry of Railways, Government of India.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### 1. SCOPE

**1.1** This standard lays down the requirements for ballast rakes.

### 2. MATERIAL

**2.1** The ballast rakes shall be manufactured from a suitable steel, such as T50 or T55 of Schedule VI of IS : 1570-1961†, with a maximum sulphur and phosphorus content of 0·06 percent each.

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\*Rules for rounding off numerical values (*revised*).

†Schedules for wrought steels for general engineering purposes.

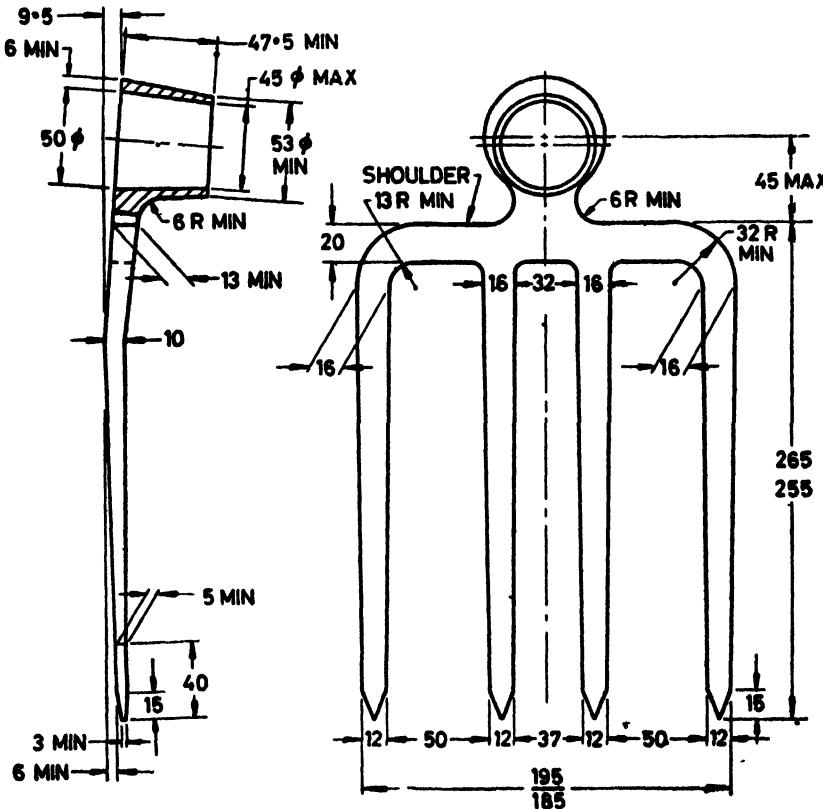
### 3. HARDNESS

3.1 The prongs shall be hardened and tempered to attain a hardness value within the range of 380 to 480 HV (*see IS : 1501-1959\**) when measured at any point not less than 50 mm from the shoulder.

### 4. DIMENSIONS

4.1 The main dimensions for ballast rakes shall be as given in Fig. 1.

4.1.1 The permissible tolerances on the essential dimensions shall be as indicated in Fig. 1. Tolerances on other dimensions shall be in accordance with general forging practice.



All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR BALLAST RAKE

\*Method for Vickers hardness test for steel.

## 5. HANDLES

5.1 The handles shall conform to the requirements of those of 4 as specified in IS : 620-1965\*.

## 6. MANUFACTURE

6.1 The ballast rakes shall be forged in one piece. The eye shall be well shaped and central.

## 7. WORKMANSHIP AND FINISH

7.1 Ballast rakes shall be well shaped, symmetrical and free from flaws, seams and other defects. All fins and flashes produced during forging shall be dressed to reasonably level surface.

## 8. PRESERVATION AND PACKING

8.1 The ballast rakes shall be painted, varnished or given any other suitable anti-corrosive treatment. The rakes shall be bundled and suitably secured as may be specified by the purchaser.

## 9. MARKING

9.1 The ballast rakes shall be clearly marked with the manufacturer's name or trade-mark.

9.1.1 The ballast rakes may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 10. SAMPLING

10.1 Unless otherwise agreed to between the supplier and the purchaser, the sampling plan as given in Appendix A shall be followed.

## 11. TESTS

11.1 **Prong Test** — The prongs of ballast rakes shall be tested by bringing any two adjacent prongs together and the permanent set noted. At the end of this, the prongs shall show no sign of permanent set or damage.

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\*General requirements for wooden tool handles.

**A P P E N D I X A**

( Clause 10.1 )

**SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY****A-1. SCALE OF SAMPLING**

**A-1.1 Lot** — In any consignment all the ballast rakes manufactured under essentially similar conditions shall constitute a lot.

**A-1.2** For ascertaining the conformity of the lot to the requirements of this specification, tests shall be carried out for each lot separately. The number of ballast rakes to be selected for this purpose shall be in accordance with col 1 and 2 of Table 1.

**TABLE 1 SAMPLE SIZE AND CRITERIA FOR CONFORMITY**

LOT SIZE (N)	FOR HARDNESS, DIMENSIONS, HANDLES, MANUFACTURE, WORKMANSHIP AND FINISH		PRONG TEST, SUB-SAMPLE SIZE
	Sample Size (n)	Permissible No. of Defectives	
(1)	(2)	(3)	(4)
Up to 25	3	0	2
26 to 50	5	0	2
51 „ 100	8	0	3
101 „ 150	13	1	4
151 „ 300	20	1	5
301 and above	32	2	8

**A-1.3** The ballast rakes shall be selected at random and to ensure the randomness of selection random number tables shall be used (*see IS : 4905-1968\**). If the tables are not available, the following procedure is recommended for use:

Starting from any ballast rake in a lot, count them in one order as 1, 2, 3,....., up to  $r$  and so on where  $r$  is the integral part of  $N/n$  ( $N$  being the lot size and  $n$  the sample size indicated in col 2 of Table 1). Every  $r$ th ballast rake thus counted shall be selected to constitute the sample.

\*Methods for random sampling.

## A-2. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

**A-2.1** All the ballast rakes selected according to A-1.3 shall be examined for hardness, dimensions, handles, manufacture and workmanship and finish as specified in 3, 4, 5, 6 and 7 respectively. Any ballast rake failing to meet the requirements of any one or more of the characteristics shall be considered defective.

**A-2.1.1** If the number of defective ballast rakes in the sample is less than or equal to the corresponding permissible number of defectives given in col 3 of Table 1, the lot shall be declared conforming to the requirements of characteristics mentioned in A-2.1.

**A-2.2** From the lots found satisfactory in accordance with A-2.1.1 a sub-sample of the size indicated in col 4 of Table 1 shall be selected and subjected to prong test. The ballast rake may be selected from those already tested in A-2.1.

**A-2.2.1** If all the ballast rakes subjected to prong test satisfy the necessary requirements, the lot shall be declared as conforming to the requirements of this standard.

**INDIAN STANDARDS**  
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3650-1966	Combination side cutting pliers	...	...	...	...	...	1·00
4378-1967	Nippers	...	...	...	...	...	2·50
4481-1968	Duckbill pliers	...	...	...	...	...	2·00
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4915-1968	Welders' chipping hammer	...	...	...	...	...	2·00
5006-1968	Battery terminal pliers	...	...	...	...	...	1·50
5066-1969	Glass pliers	...	...	...	...	...	2·00
5067-1969	Fencing pliers	...	...	...	...	...	2·00
5068-1969	Grab hook	...	...	...	...	...	2·00
5087-1969	Wire stripping pliers	...	...	...	...	...	2·50
5169-1969	Hacksaw frames	...	...	...	...	...	5·00
5200-1969	Bolt clippers	...	...	...	...	...	3·50
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5658-1970	Snipe nose pliers	...	...	...	...	...	2·00
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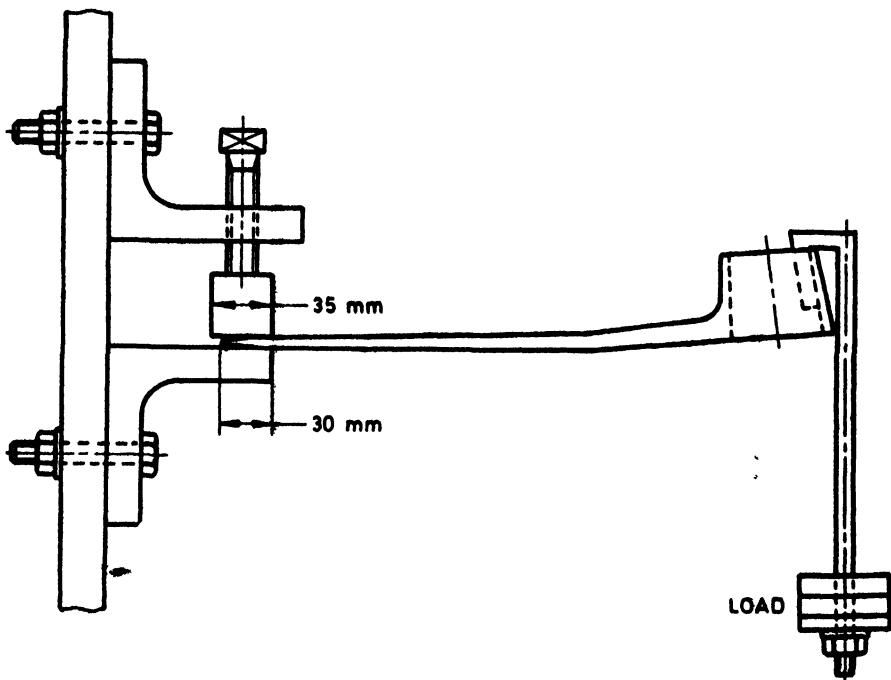
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**AMENDMENT NO. 1      NOVEMBER 1978**  
**TO**  
**IS : 5991-1971    SPECIFICATION FOR**  
**BALLAST RAKES**

**Addendum**

( *Page 5, clause 11.1* ) — Add the following new matter after 11.1:

**11.2 Load Test** — The ballast rakes shall be subjected to load test as shown in Fig. 2. The load test shall be carried with 50-kg load and the ballast rakes shall not show any permanent set after removing the load.'



**FIG. 2   LOAD TEST OF BALLAST RAKE**

(EDC 12)